

## Lipid Peroxidation (MDA) Colorimetric Assay kit

Cat #: orb1173250 (manual)

Size: 48 T/96 T

**Product name:** Lipid Peroxidation (MDA) Colorimetric Assay kit

**Catalog number:** orb1173250

**Applicable samples:** Serum, Plasma, Urine, Animal and Plant Tissues, Cells, Bacteria

**Storage:** Stored at 4°C for 6 months, protected from light

### Assay Principle

Oxygen free radicals react on lipid unsaturated fatty acids to produce lipid peroxidation. The latter gradually breaks down into a series of complex compounds, including malondialdehyde (MDA). Lipid oxidation levels can be measured by detecting MDA levels. Lipid peroxidation may contribute to many diseases, including atherosclerosis, diabetes, and Alzheimer's disease. Lipid Peroxidation (MDA) Assay kit provides a convenient tool for detection of the malondialdehyde (MDA) present in a variety of samples. Malondialdehyde (MDA) can be condensed with thiobarbituric acid (TBA) under acidic and high temperature conditions to produce the brown-red trimethyltran (3,5, 5-trimethyloxazol-2, 4-dione) with a maximum absorption wavelength of 532 nm. Meanwhile, the absorbance at 600 nm was measured to eliminate the interference of sucrose, and MDA was calculated by the difference between the absorbance at 532 nm and 600 nm.

### Materials Supplied and Storage Conditions

Kit components	Size		Storage conditions
	48 T	96 T	
Extraction Buffer	50 mL	100 mL	4°C
Reagent I	1	1	4°C, protected from light
Reagent II	15 mL	30 mL	4°C

### Materials Required but Not Supplied

- Microplate reader or visible spectrophotometer capable of measuring absorbance at OD532 nm and OD600 nm
- 96-well plate or micro glass cuvette, precision pipettes, disposable pipette tips
- Incubator, centrifuge
- Deionized water
- Homogenizer (for tissue samples)

### Reagent Preparation

**Extraction Buffer:** Ready to use as supplied. Equilibrate to room temperature before use. Store at 4°C.

**Reaction Mix:** Prepared before use. Reagent I was all transferred to Reagent II bottle for full dissolution. Reaction Mix is difficult to dissolve and can be heated at 70 °C and violently oscillated to promote dissolution, or treated by ultrasound to promote dissolution. Stored at 4°C for 6 months.

### Sample Preparation

1. Animal or Plant Tissues: Weigh about 0.1 g Tissue and add 1 mL ice-cold Extraction Buffer, homogenize on ice. Centrifuge at 13,000 g for 10 min at 4°C, take the supernatant for further analysis.
2. Cells or Bacteria: Collect  $5 \times 10^6$  cells or bacteria. Wash cells or bacteria with cold PBS, discard the supernatant after centrifugation, add 1 mL ice-cold Extraction Buffer to ultrasonically disrupt the cells or bacteria in ice bath 5 min (power 20% or 200 W, ultrasonic 3s, interval 7s, repeat 30 times). Centrifuge at 13,000 g for 10 min at 4°C, take the supernatant for further analysis.
3. Serum, Plasma and Urine: Tested directly by adding samples to the microcentrifuge tubes. However, to find the optimal values and ensure your readings will fall within the standard values, we recommend performing several dilutions of the samples.

**Note: If you cannot perform the assay at the same time, we suggest that you freeze the sample at -80°C. The sample will be stable for at least one month.**

### Assay Procedure

1. Preheat the microplate reader or visible spectrophotometer for more than 30 min, and adjust the wavelength. Visible spectrophotometer was returned to zero with deionized water.
2. Add the following reagents to EP Tube:

Reagent	Blank Tube (μL)	Test Tube (μL)
Reaction Mix	300	300
Deionized Water	100	0
Sample	0	100

3. Mix well and incubate in water bath 30 min at 95°C (cover tightly to prevent moisture loss). Then cool to room temperature in an ice bath. Centrifuge for 10 min at 25°C at 10,000 g.
4. Transfer 200 μL of the supernatant into a 96-well plate or micro glass cuvette. Measure the absorbance at 532 nm and 600 nm. Calculate  $\Delta A = A_{532} - A_{600}$ . Calculate  $\Delta \Delta A_{\text{Test}} = \Delta A_{\text{Test}} - \Delta A_{\text{Blank}}$  (Only one blank well needs to be detected).

**Note: In order to guarantee the accuracy of experimental results, need to do a pre-experiment with 2-3 samples. If  $\Delta \Delta A_{\text{Test}}$  is greater than 1.0, the sample can be appropriately diluted with Extraction Buffer, the calculated result multiplied by the dilution factor. If  $\Delta \Delta A_{\text{Test}}$  is less than 0.001, increase the sample quantity appropriately.**

## Data Analysis

**Note: We provide you with calculation formulae, including the derivation process and final formula. The two are exactly equal. It is suggested that the concise calculation formula in bold is final formula.**

### A. 96-well plate calculation formula

#### 1. Calculated by protein concentration

$$\text{MDA (nmol/mg prot)} = [\Delta\Delta A_{\text{Test}} \times V_{\text{Reaction Total}} \div (\epsilon \times d) \times 10^9] \div (\text{Cpr} \times V_{\text{Sample}}) = \mathbf{51.6 \times \Delta\Delta A_{\text{Test}} \div \text{Cpr}}$$

#### 2. Calculated by fresh weight of samples

$$\text{MDA (nmol/g)} = [\Delta\Delta A_{\text{Test}} \times V_{\text{Reaction Total}} \div (\epsilon \times d) \times 10^9] \div (W \times V_{\text{Sample}} \div V_{\text{Sample Total}}) = \mathbf{51.6 \times \Delta\Delta A_{\text{Test}} \div W}$$

#### 3. Calculated by number of cells or bacteria

$$\text{MDA (nmol/10}^4) = [\Delta\Delta A_{\text{Test}} \times V_{\text{Reaction Total}} \div (\epsilon \times d) \times 10^9] \div (500 \times V_{\text{Sample}} \div V_{\text{Sample Total}}) = \mathbf{0.1032 \times \Delta\Delta A_{\text{Test}}}$$

#### 4. Calculate by liquid sample (serum, plasma and urine)

$$\text{MDA (nmol/mL)} = [\Delta\Delta A_{\text{Test}} \times V_{\text{Reaction Total}} \div (\epsilon \times d) \times 10^9] \div V_{\text{Sample}} = \mathbf{51.6 \times \Delta\Delta A_{\text{Test}}}$$

Where:  $V_{\text{Reaction Total}}$ : total reaction volume,  $4 \times 10^{-4}$  L;  $\epsilon$ : MDA molar extinction coefficient,  $155 \times 10^3$  L/mol/cm;  $d$ : 96-well plate diameter, 0.5 cm;  $10^9$ :  $1 \text{ mol} = 1 \times 10^9 \text{ nmol}$ ; Cpr: sample protein concentration, mg/mL;  $V_{\text{sample}}$ : sample volume added, 0.1 mL;  $W$ : sample weight, g;  $V_{\text{Sample Total}}$ : Extraction Buffer volume added, 1 mL; 500: Total number of cells or bacteria,  $5 \times 10^6$ .

### B. Micro glass cuvette calculation formula

The optical diameter  $d$ : 0.5 cm in the above calculation formula can be adjusted to  $d$ : 1 cm for calculation.

## Disclaimer

The reagent is only used in the field of scientific research, not suitable for clinical diagnosis or other purposes.